

LTC Buzby,

Fred gave me the document, "On the Quantum Mechanics of Consciousness, with Application to Anomalous Phenomena" by Drs. R.G. Jahn and B.J. Dunne, of Princeton University. He asked me to read it, and present a plain-language summary of its contents, in under 5 pages.

The thesis is extremely verbose and poorly organized, but very deep in its concepts, and contains a great deal of worthwhile information. The problem is that this information is completely outside the realm of everyday experiences. It is a mixture of nuclear physics and parapsychology. Any 5 page summary would only be useful to someone who already knew the principles and terminology of both sciences.

The combination of both these subjects into one field is so complex that the first 5 pages of my summary is simply an introduction, to bring the reader up to the level at which Drs. Jahn and Dunne BEGIN their thesis. I compiled this through outside readings, and my own prior knowledge of the subjects. It can be skipped, if you are already comfortable with the laws of quantum physics, specifically defined in Schroedinger's Wave Mechanics. If not, skipping any of the introduction, or getting another paraphrased version of my summary would leave any reader as hopelessly lost as if he had never tried to learn it.

Because my summary is long, I have placed reader guides at the start of some sections, summarizing its importance to the overall paper. This allows the reader to skip over some sections, skim others, etc., depending on the amount of interest, or knowledge desired.

Dr. Jahn has written a worthwhile treatise, but it is total gibberish to the person who does not have months to spend reading it. To understand it, I had to go to many source documents in both fields. I was surprised to find so many instances where Einstein, Planck, and other nuclear physicists outrightly state that their work could be carried over to PSYCHIC human functioning. Doing this paper has greatly broadened my understanding of the phenomena, has indicated intelligent directions for future research, and has indicated a much greater potential for applied usage than I had realized before. I hope that my summary will help convey these understandings to other readers, as well.

Lyn

THE QUANTUM MECHANICS OF CONSCIOUSNESS

A plain-english explanation by L. Buchanan of a treatise by Drs. Jahn and Dunne (Princeton University) on the use of the theories of nuclear physics to explain the phenomena of the "psychic" human consciousness.

1. Introduction:

Without going into the hundreds of mathematical equations found in Dr. Jahn's document, let it suffice to say that the laws of nuclear physics do not conform to the laws of physics which we were taught in high school or college ("Newtonian" physics). The differences lie in the fact that the two branches of physics deal with different levels of the world around us:

With Newtonian physics, you are actually dealing with billions and billions of molecules, acting together. What you see as a chemical reaction (i.e. mixing two PARTS hydrogen and one PART oxygen will give you a certain amount of water) is actually only the reaction of the MAJORITY of the molecules. That is, you wind up with water, all right, but that water will be found to have free oxygen and hydrogen, which will later form into bubbles and rise to the top, because some of the atoms don't mix properly into water molecules.

With nuclear physics, you must deal with the individual atoms, themselves. You now have to say that mixing this individual atom of oxygen with these two individual atoms of hydrogen will PROBABLY give a molecule of water. The individual atoms you are working with may or may not react the way you had planned. Because of this, the realm of quantum mechanics is filled with hundreds of mathematical formulas to figure the PROBABILITY of each and every event. In fact, to the quantum physicist, all material objects are seen as only the accumulated results of molecular "majority rule".

While this may not set too well with our high school science teacher, we cannot escape the fact that very detailed and exacting experimentation has repeatedly proven the above to be true, not just in one laboratory, or for one scientist, but on a consistently repeatable and dependable basis.

The formulas which govern this probability factor have become so dependable, in fact, that our daily lives now depend on the amount of electron "leakage" between the molecular layers of a microchip, and the fact that nuclear weapons can be kept decaying at a predictably slow rate, until instability is ordered.

2. How this relates to psychology and parapsychology:

Early on in the development of nuclear physics as a science, many facts were found which directly apply to the human "mind" and its functioning. It is those aspects of nuclear physics with which we are concerned.

For example, the firing of the synapses of the brain works on a molecular level. That means PROBABLE firing of a synapse for any given stimulation. Therefore, human thought, actions, reactions, or even consciousness can no longer be considered as a set pattern of cause and effect, but as a PROBABLE reaction to a cause. The nuclear physicist has, therefore, discovered a definite physical cause for human inconsistency.

The most astounding discovery, though, deals with an entirely unsuspected phenomenon, which had revolutionized all of scientific thought:

In essence, when a scientist studies an experiment at the molecular, it no longer gives the same results as would "normally" be found. For example, we estimate that one hundred atoms of hydrogen mixed with fifty atoms of oxygen should "normally" give about 40 molecules of water, with stray H and O atoms left over. However, when studied closely by the quantum physicist, the result was always off by an amount which could not be predicted by the laws of probability. Clearly, some other factor was at work. It was later realized that the very act of observing a molecular reaction changes its outcome. In short, it has been proven that the thoughts of the scientist affect the material of the experiment.

That smites very heavily of "mind over matter", and could be very upsetting to scientific thought. Yet, Einstein, Planck, Pauli, DeBroglie, and a host of other physicists working in this area have commented about this very fact in their writings, and have made outright comments about the fact that it predicts, if not proves, that psychic functioning is a scientific reality.

As revolutionary as that is, it is actually not too far-fetched. The atom, itself, is not made of solid material, but only of positive and negative charges. Since thought, itself, is a form of electrical stimulation, and therefore has some electrical charge, it is not too surprising that the thoughts of the scientist could in some way affect the material he is thinking about.

To quote Dr. Jahn:*

* Within quoted passages, three dots indicate that words have been omitted. Brackets indicate a replacement for cumbersome words or phrases. Parentheses indicate my own personal comments about the material in the quote. Dr. Jahn's statements will be especially marked up in this way, due to his extreme verbosity and use of unclear words and phrases.

"... any process of observation must transfer some...energy to the system being observed, ...disturbing it to a degree. ...at some level, a graininess ensues... When...that grain becomes comparable with the scale of the observed [material, anomalies] must be expected."

But he immediately adds:

"...inversely, the bizarre...behavior of atomic systems must blur over into...common experience... In this sense, quantum mechanics should be regarded as the more fundamental [science, with Newtonian physics] as a special case whenever very large numbers of [molecules] are involved."

In simpler words, Dr. Jahn is saying that it is only natural that man can affect the workings of a single or a few molecules, simply by thinking about them. But that when it comes to the billions and billions of molecules in, say, a big rock, forget it!

But many people have not been able to simply "forget it". Parapsychologists already had too many successful experiments showing that a person's thoughts could affect larger objects, as well. For instance, coin flipping, dice rolling, metal bending, etc.

Because quantum physicists had discovered a method whereby a person's thoughts can affect the material world, parapsychologists turned to them, to see whether or not they had any explanations. It so happened that they had.

3. The application of quantum physics' to parapsychology quickly answered one question which had plagued the parapsychologist for years: "psychic" thought does not directly influence the fall of a coin, or the roll of dice, but affects only its PROBABILITY. Therefore, to expect a 100% dependable and repeatable performance by any "psychic" is unrealistic.

The quantum physicist's ability to work with the mathematics of probability was perhaps the greatest contribution made to parapsychology. Up until this time, parapsychologists had performed experiments, kept records, compared results, etc. In other words, they had mainly been bookkeepers. Now, the quantum physicist began to add his special abilities to work with the mathematics of probability. He could specify exactly how much deviation from "normal" could be expected, what percentage of the time, and under what conditions.

For example, prior to this time, the parapsychologist had been concerned with whether or not a "psychic" could influence the path of a rolling ball, with his thoughts. The nuclear physicist already knew it could be done, and could predict the amount of deviation, according to what the ball was made of, and could apply this to other applications. (For example, one experimenter, seeing that a "psychic" had caused a deviation of a rolling ball by a certain amount, deduced the amount of "psychic" force which had been required. He then predicted that if that force were applied to a standing ball, it could hold the ball on a sloping incline of 0.08° , without it rolling off. This further experiment was tried, and found to be successful, but only for balls made of certain materials. This allowed for further refinement of understanding of the principles involved.)

But making a ball stay on a 0.08° incline has little purpose to everyday life. Just as the quantum physicist uses his knowledge to tell an inventor whether or not a microchip will work, the parapsychologist should be able to accurately predict and guide practical applications of the "psychic" sciences.

4. A scientific formulation:

In order to study, expand, train, and/or manipulate consciousness in a scientific manner, there must be scientifically formulated rules to work by. One way of formulating such rules is to blunder through trial and error experiments until we have learned what works and what doesn't. A better way is to take rules which already exist for a closely related branch of science and see how well they "fit" our new branch. As experimentation finds which of the "old" laws do/do not work with the new branch, a proper set of rules is customized for the new branch.

So parapsychologists looked again to the nuclear physicist for help. Drs. Jahn and Dunne have suggested that the rules of Schroedinger Wave Mechanic Theories are best suited for this purpose. Its rules apply to normal human consciousness, and many of the more "anomolous" human experiences, such as emotional awareness, altered states, psychic phenomena, etc.

The reader must always remember that the laws of Schroedinger wave mechanics are NOT the laws of parapsychology. They are only being looked at here to see which of its rules apply*.

*The danger is that the student of this new science, accustomed to accepting scientific rules as truth, will forget that the rules being used here are borrowed. While each rule applies to quantum mechanics, it may or may not actually be valid for parapsychology. Until proven valid, each rule must be considered only as a guide. Dr. Jahn suggests that we take these laws as only "metaphors", and that we learn their truths, without taking them literally. For example, when one hears the metaphor that an atom is just a tiny planetary system, it is easy to accept it as a meaningful truth, but that doesn't mean it is in any way a scientific fact.

5. Basic rules:

The study of any science must be based on one or more commonly agreed upon understandings. The following 5 form the basis of understanding for Dr. Jahn and Dr. Dunn's treatise:

a. Human consciousness both affects and is affected by the material of the world around it. Therefore, when studying either human consciousness or human environment alone, we must constantly be aware that everything about each is influenced by the other. *

b. Consciousness may both give information to and extract information from the environment. Therefore, the relationship between the two must also be studied.

c. The laws by which we study our environment and our consciousness are simply formalizations by which we become more conscious of them.

d. We, as humans, tend to find similarities between some of the physical laws (i.e. we think of the atom, which we can't see, as a small solar system, which we can). We group our consciousness of the environment into "families" of understandings, and use what we have learned about one science to learn about another.

e. Therefore, many questions about a non-physical science (consciousness) should be answerable "metaphorically" by laws governing the physical sciences (environment). It may also follow that many of the questions in the physical sciences may be answered by things learned during research of the non-physical. Therefore, a full scientific concept of reality must include an understanding of both the physical and non-physical sciences, and of the interactions between them.

*In this respect, if a person decides to influence the motion of an object psychokinetically, he/she may well do so to a undetectable degree, and then no further action is accomplished. A probable reason for this, according to our law, is that the person, having detected no immediate change, perceives that there is no change, (doesn't allow himself to believe it has happened). The belief that nothing has happened then becomes the affected reality. By the same principle, the pre-determined belief that nothing will happen is considered to be an affecting influence, whether the pre-determined belief is held by the "psychic", himself, or an influential spectator. -LB

6. Specific terminology:

THIS SECTION DEALS WITH THE BASIC TERMS WHICH ARE USED THROUGHOUT THE TREATISE. I WOULD SUGGEST THAT THIS SECTION BE MARKED FOR REFERENCE AS THE READER CONTINUES THE PAPER.*

For an understanding of the principles of Schroedinger Wave mechanics to human consciousness, one must first understand some of the basic terms of the science.

EIGENFUNCTIONS: a stable spot in a fluid and moving medium: a "standing wave": a place which has a stable state or value, due to all the patterns of moving forces around it.

EVANESCENT WAVES: waves which travel across the medium, rather than standing in one place.

WAVE/PARTICAL DUALITY: the fact that on the quantum mechanics level of physics, a duality exists:

When the scientist tests the molecular structure for waves of energy, at certain frequencies, etc., the molecule will react according, and will show itself to be energy in motion.

However, when the scientist tests for "parts" of molecules, the molecule reacts accordingly, and shows itself to be made up of "pieces" (particles) of energy. In other words, it will act as though each "part" of the molecule were an eigenfunction within its space/time medium.

WELLS: those places in the continuum where eigenfunctions are prone to form. Note that this is different from the eigenfunction, which is the standing wave which forms in the well.

* This section is placed here, to follow the structure of Dr. Jahn's paper, which is very disorganized.

7. The wave mechanics of consciousness:

Dr. Jahn and Dr. Dunne, after a rather lengthy 22 page introduction "proceed with the thesis of their paper".

They stress the need for a different way of thinking from the "commonly held" one which exists, today. The present concept is that an individual consciousness (a person) is located at one place in space and time, interacting only with a few specific aspects of its environment and with other people. So people are comparable to some molecules in an elaborate "container", bouncing around against their neighbors and the container walls. They suggest that this concept is now outmoded, and that it be replaced by a wave-mechanical image:

"Specifically, ...that [when unrestrained], [human consciousness] takes the functional form of the free wave..., [existing] uniformly over all space and time."

So the consciousness can act like a wave, and flow across space and time, or it can be located at one spot, like a particle. As we normally know it, it is located in the body in which it "lives". Its own characteristics are then influenced by the body, and the environment around that body.

(At this point, the thesis turns to the specifics of quantum mechanical theory and laws, as applied to the problem of human consciousness.)

So, the concept of man as a "particle" (a human being with an individual consciousness) is changed to a concept of a single huge consciousness-wave which encompasses all mankind. Each person is a small "eigenfunction" of that larger energy, each capable of interacting with its neighbors and with its environment by all means accessible to quantum mechanics. Among these means would be included:

a. "collisional" mechanisms (see original document for mathematical functions and formulas.) The "collision" laws of wave mechanics provide us with metaphors to explain many common interactions between consciousness and some aspect of its external environment, in particular, between itself and another consciousness. These interactions may be:

- 1) elastic: ... an interaction which does not permanently influence either the consciousness, or its environment;
- 2) inelastic: ...an interaction that leaves its mark on the consciousness, on its environment, or on both;
- 3) radiative: ...an interaction which liberates an energy that can influence remote aspects of the environment;

4) reactive: The reaction of a consciousness with its environment creates a new consciousness/environment.

b. the emission and reception of radiation:

"...common mechanisms for longer range perception, communication and interaction, including simple optical, acoustical, and olfactory links."

c. Communication between two consciousnesses:

Mechanisms of "tunneling" or leakage...between...the [eigenfunctions represent various] 'paranormal' communication. The standing waves within the wells could drive evanescent waves [between them], whose influence could be felt in adjacent wells. Utilization of the free wave "continuum" for paranormal communication is, in one sense, just the limiting case of the tunneling mode for [individuals] reaching sufficient 'energy' to escape the well...and flow over the entire space, wherefrom they may re-establish some bound resonances with other [individuals] in the configuration. [All of this could extend] well into the philosophical, or even theological domains. This...could [be used for] such extreme phenomena as astral projection, bilocation, mediumship, and even reincarnation. It might also be a useful vehicle for dealing with...biological swarm behavior, Jung's 'collective unconscious', and various theological tenets of collective spiritual influences, such as prayer. In the ultimate application, it could address the spiritual survival of bodily death."

"Each of these mechanisms bears some conceptual correspondence to various processes of normal and paranormal communication, and we shall attempt to exploit them."

8. A reminder to the reader:

THE FOLLOWING SECTIONS GO MORE HEAVILY INTO SCHROEDINGER WAVE MECHANICS. IT IS IMPORTANT FOR THE READER TO REMEMBER THAT THE TERMS OF NUCLEAR PHYSICS USED HERE ARE BEING USED AS AN ANALOGY. IF THIS FACT IS CLEAR IN THE MIND OF THE READER, I WOULD SUGGEST THAT THE FOLLOWING EXAMPLE BE SKIPPED OVER, AND THAT THE READER PROCEED TO THE NEXT SECTION OF THE PAPER.

Quantum physics states that the gravitational attraction of one atom on another is a function of the square of the distance between the two, influenced by the angle between the first and second atoms, in relation to the first atom's angle, direction, and speed of spin on its axis.

That rule obviously does not apply to our study of parapsychology. However, the question is, "Is the principle the same?" Dr. Jahn looks into this:

Where Schroedinger's laws speak of "r" as the "radius of influence" (the distance between the atoms), psychology and parapsychology would use the "r" as the amount of awareness the person has of his/her environment.

Schroedinger's "angle and direction of the first atom's spin" would mean the person's attitude about his/her environment.

Schroedinger's "speed of the first atom's spin", for our purposes, would mean the strength of this attitude.

The relationship of these angles, directions and speeds, would also have to include the awareness and attitude of the second person to the first.

Now, we can logically imagine that one person's consciousness will affect another person's by the relationship of their attitudes. But if Schroedinger's law applies here*, we can predict whether or not a second person's consciousness can be influenced by the square of the "mental awareness" of the first person. Tests for mental awareness can be devised. If research proves this to be true, then the same law which Schroedinger uses for atomic physics can be used for parapsychology. If not, then that law is "weeded out". In the above example, it can be seen that the parapsychologist

* It is the obligation of the scientist to remain consistent. If we take Schroedinger's "radius" to mean "awareness" in this formula, it must mean the same in all formulas taken from one science to the other. The scientist cannot be allowed to bend each and every formula to fit his/her needs of the moment.

now has a way to quit the "trial and error" bumbling which he has previously been forced to conduct. He has previously taken people off the streets and tested them for their ability to guess what is on the face of a card which someone else is holding. Then, he has kept records (bookkeeping), which often told him nothing.

Now, the parapsychologist, aware of this law, can select his subjects by their scores on a mental awareness test, by their "orientations" on psychological tests, etc. As such, the only unknown factors will be the "psi" factor, for which he is testing. Testing will then give the answers which are wanted, without random variables confusing the results.

9. The atomic structure of the consciousness experience:

THIS SECTION IS THE LEAST PERTAINANT TO THE PURPOSE OF THIS SUMMARY PAPER. IT IS INCLUDED HERE AS A REFERENCE. THE READER WHO IS JUST FAMILIARIZING HIMSELF WITH THE SUBJECT SHOULD SKIP THIS SECTION AND CONTINUE WITH THE NEXT.

At this point, Drs. Jahn and Dunne have shown that those laws of Schroedinger wave mechanics which deal with molecular functions seem to be laws which can be carried over intact. There are also laws within Schroedinger wave mechanics which deal with atomic structure. Since the "structure" of human consciousness is of importance in the fields of psychology and parapsychology, Drs. Jahn and Dunne continue to see whether the further laws of Schroedinger wave mechanics also apply.

In looking at the structural laws, Drs. Jahn and Dunne weeded out several of the laws as being less applicable than those which deal with spherical polar coordinates. Schroedinger, himself, spoke of "spheres of consciousness" in his philosophical writings.

In dealing with spherical forms, Schroedinger mechanics naturally deals with spherical trigonometry. The reader should refer to the original document for any mathematical formulas, as I will only use examples.

If you were to take a ball, and draw a line around it, you would, in effect, have drawn a circle. If you then labeled the points on this circle with their sine values, the top and bottom of the circle would have a value of 0 and the sides of the circle would have a value of 90.

Dr. Jahn then takes the analogy of "spherical forward velocity" (Roll the ball.), and shows how the "eigenfunction values vary in a sinusoidal pattern" (The parts of the circle touching the ground go from 0 to 90, to 0, to 90, to 0, etc.).

Dr. Jahn then takes this as an analogy of the forward progression of the human consciousness: as a person's consciousness progresses from where it is to where it will be, its "angle of awareness" increases, decreases, increases, etc. Therefore, man's awareness, even if his strength of awareness (possibly his IQ) is great, will go in "stages". This can cause such human phenomena as, for example, learning plateaus, social strata, "stages" of mental and physical development, biorhythms, etc.

By the same analogy, any disturbances of this "progression" can be shown to affect the individual's consciousness, not in direct proportion to the "angle" at which it hits the individual, but trigonometrically. That is, using common slang, something which "hits you head-on" can stop your progress, to the amount of

the relationship of your "irresistible force" to its "immovability". However, something which "broad-sides you" will change your direction, but shouldn't stop you. Using these analogous laws, the clinical psychologist could more adeptly devise situational treatments to retard a patient's progression into a demented condition.

There are many other analogous patterns developed, but in summation, Drs. Jahn and Dunne liken the "spherical atom" to the following parts of human consciousness:

angular momentum equates to attitude or emotional set
energies within the atom equate to human energies
electron spin equates to "yin/yang", "male/female", etc., in that its direction determines the effects of its energy.

Drs. Jahn and Dunne continue throughout the entire document to refer to the physical structure of consciousness. Otherwise, I would not have included this section into the summary.

10. Covalent bonds:

THIS SECTION IS PERHAPS THE CLOSEST WHICH DRS. JAHN AND DUNNE COME TO PROVIDING THE READER WITH A "HOW-TO-DO-IT". FOR AN IN-DEPTH READING OF THE PAPER AT THIS POINT, REFER TO PAGES 36-44 OF THE TREATISE.

A's observation of an event affects that event. That is a proven fact. According to the laws, the event will also have an affect on A, in the process.

Therefore, the wave-mechanics metaphor would indicate that it is more proper to look at the whole process of "psi functioning" as an interaction, rather than an action. The idea here is that the "psychic" does not cause something to happen by "acting on it" (i.e. by mentally pushing or pulling). He instead becomes a part of an integrated "bond" with another person or object, and "interacts with" it.

Einstein, in writing about this very question of psi interaction, wrote:

"If the partial systems A and B form a total system..., there is no reason why [one should view] A and B separately, not even if the partial systems are spatially separated from each other at the particular time under consideration. (emphasis is Einstein's) The assertion that...B could not be [directly] influenced by any measurement taken on A is, therefore...unfounded and unacceptable." *

Further development of the metaphor leads to the question of whether "psi phenomena" is really an anomolous event or not. The metaphoric laws predict that although some event might be anomolous for either A or B, it might be very normal for the bonded AB system.

The most common example is that of people "falling in love". An emotional bond happens between two individuals. Resultant actions on the parts of these individuals might be considered anomolous for either person, if taken singly, but would be considered normal for the "union" they have formed.

This same analogy holds for such "psi phenomena" as healing; the action of "healing" and the action of "being healed" are not "normal" actions for either participant. But when considering the actions of a symbiotic union formed between the two, the the healing process could be considered to be quite normal, indeed.

* P.A. Schilpp, Ed., Albert Einstein: Philosopher-Scientist. Evanston, Ill.: Library of Living Philosophers, Inc. (George Banta Publishing Co., Menasha, Wi.) 1949, pp.681-682.

It has generally been found by researchers in the field that the patterns followed by "psychics" have historically obeyed this rule. It is quite customary for such "bonds" to be set up between healer and healed, between "mover" and object, between lovers, between mother and child, etc.

It is also historically quite customary that the spectator, who sees the participants of the psi event as individuals, views the event as anomolous, whereas the participants of these events, aware only of the bonded system which they have formed, have a tendency to view the occurrences as normal, and even show surprise that anyone should think otherwise.

11. The metaphoric principles:

THIS SECTION DEALS WITH THE FIVE MAJOR METAPHORIC PRINCIPLES UPON WHICH THE CONVERSION OF THE LAWS FROM THE ONE SCIENCE TO THE OTHER IS BASED. IT ALSO BRINGS TO LIGHT WHAT EACH MEANS TO PARAPSYCHOLOGY. I WOULD SUGGEST READING THIS SECTION IN FULL.

The following five principles, taken from quantum wave mechanics, not only show that the laws are applicable to parapsychology, but also suggest that parapsychology might simply be the natural result of the physical laws of the universe. These principles are:

A. The indistinguishability principle:

When two electrons occupy the same "potential shell" of an atom, there is no way to distinguish between them. The scientist simply sees twice the electron charge, or attraction, but cannot separate one electron from another.

A reference back to section 10, above, is the best way to show how this applies to parapsychology. In A's attempt to join with B and form a "bonded unity", A becomes indistinguishable from B. When such a level of consciousness is accomplished, the system which they form is in its most capable condition for producing actions which would be considered anomalous for either A or B, alone.

"However expressed, the functional import of this principle for our model and for the design of experiments is much the same: this ability to exchange or share identities should facilitate paranormal experience."

B. The Exclusion principle:

Dr. Wolfgang Pauli's Exclusion principle* also applies here. Essentially, the rule implies for the parapsychologist that even though A and B join into a union which is neither A nor B, it does not become C. A total loss of identity can never happen. A mixture of two gasses (H and O) can act as a liquid (water), but within that mixture, H is still H and O is still O.

* Dr. Wolfgang Pauli, Austrian physicist working in the U.S., 1945 Nobel prize winner, developed the Pauli Exclusion principle; that no two electrons, protons, or neutrons in a given system can be in states characterized by the same set of quantum numbers.

C. The Correspondence principle:

In the physical realm, there is a "changeover" point between nuclear physics (with all its probability) and Newtonian physics (with all its certainty). DeBroglie's* and Bohr's** laws can be summarized by saying that using Newtonian laws of physics at the molecular level is like "performing brain surgery with a sledge hammer", and that using Quantum physics laws at the everyday level is like "using a spoon to dig a ditch".

By the same token, there must be a "changeover" point between "normal" and "psychic" activity. That changeover point not only separates the study of parapsychology from "everyday occurrences", but also the separation point between it and "normal" psychology. It also predicts that "normal" laws will normally apply to human activity, but that at a certain point in the concentration of consciousness, we must expect a new set of laws to apply.

D. The Uncertainty and Complementarity principles:

The principles involved here, in essence, state that the narrower your perspective, the less you see.

In the physical realm, this means that in order to completely define any characteristic of a physical sample, you have to test it under all conditions.

As this applies to parapsychology, it is perhaps best to quote Dr. Niels Bohr:

"...in associating the psychic and physical aspects of existence, we are concerned with a special relationship of complementarity which it is not possible to thoroughly understand by one-sided application either of physical or of psychological laws."

Narrowing your perspective to one thing means that you do not

* Dr. Lewis Victor de Broglie, French physicist, 1929 Nobel prize winner, stated, basically (my paraphrasing) that when the dimensions of the experiment become equal to or smaller than the wavelengths of the system being tested, quantum physics laws must be used. When larger dimensions are used in the experiment, Newtonian physics will suffice.

** Dr. Niels Bohr, Danish atomic physicist, 1922 Nobel prize winner, defined the transitions taking place in the area of "changeover" between the two sciences, and also devised the "complementarity principle" which pertains to the 4th principle, below.

see another. This is addressed further in the writings of Dr. Heisenberg*:

"We realize that the situation of complementarity is not confined to the atomic world alone; we meet it when we reflect [between] a decision and the motives for our decision, or when we have the choice between enjoying music and analyzing its structure."

Dr. Jahn brings out the point that, although attention to one aspect might mean ignoring another, it doesn't necessarily mean that the two aspects are opposites. In Dr. Heisenberg's example, above, both enjoying and analyzing are parts of the study of music. Dr. Jahn then brings out this summary:

"In closing this...metaphor, it might be worthwhile to consider its escalation to an affirmative... Namely, it may actually define the most productive and fulfilling regimes of conscious activity, e.g., [attention to one thing changes it, but that change causes further change to that part to which you didn't pay attention, and therefore, the whole is] brought into balance.

[Common examples are where an overall improvement is created by a person who is 'immersed only in his one particular job', and so, does it better], or of the actor, dancer, athlete, or skilled artisan whose mechanical skills...are complemented by an emotional immersion in the role, which, in concert, produce a transcendent performance or product. Testimony from such genius or artistry commonly speaks to the necessity for dynamic and symbiotic balance between the skills and the immersion..., if the highest creativity is to be attained. A similar complementarity may well be requisite to the achievement of anomalous phenomena, and could be a useful criterion for the design of psychic experimentation."

E. The Statistics principle:

Laws for "psi" behavior are expected to be more elaborate versions of the same laws as govern "normal" behavior, but with necessary differences. As evidence accumulates to show that "psi" behavior follows its own sets of laws, it is seen less as behavior which is "outside the law", or "anomalous", and more as behavior which is "normal", but in different circumstances. The present problem is not that people do not want to accept and understand "psychic" behavior, but that people cannot accept this behavior because they don't understand it.

* Dr. Werner Heisenberg, nuclear physicist, is most famous for his "uncertainty" principle which states in exact mathematical terms what is commonly known as the "law of probability".

12. Summary:

Drs. Jahn and Dunne have shown that the principles of quantum physics (specifically, Schroedinger's wave mechanics) can be moved over "metaphorically" to form a firm basis of laws for the study of parapsychology.

They have further shown that, just as Quantum physics is just a refinement of laws, in order to answer questions not addressed by "normal" physics, so parapsychology should be considered as just a refinement, to answer questions not addressed by the laws of "normal" psychology.

They have stressed several very important applications of this refinement, and have gone to great lengths to show, both logically and mathematically, that these applications are appropriate and necessary to the further study of parapsychology as a science.